REMARKS

At the outset, Applicants acknowledge with appreciation Examiner Langel's courtesy in conducting the November 16, 2005 personal interview. During the interview, Applicant, Applicants' representative and Examiner Langel discussed proposed claim amendments that would overcome the rejection of claims 1-8 under 35 U.S.C. § 112, second paragraph. Applicant, Applicants' representative and Examiner Langel also discussed the rejection of claims 1-8 under 35 U.S.C. § 103(a). Applicants have attached a graph, showing the surprising results of the claimed catalyst, as discussed during the interview. The graph displays the results of Table 1 in graphical form.

Claims 1-8 are pending in this application. Claims 1-8 have been amended. No new matter has been added.

Claims 1-8 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1, 2, 4, 7, and 8 have been amended to address the concerns set forth in the Office Action. Applicant respectfully submits that the claims as amended are in compliance with 35 U.S.C. § 112.

Claims 1-8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over EP 0296734 or Schiodt et. al (US 2001/0055560) (Schiodt) or Holzle et. al. (US Patent No. 6,919,066) (Holzle) or Chinchen (US Patent No. 4,177,252) in view of Baumann et all (US Patent No. 6,555,088) (Baumann).

The Examiner asserts that EP 0296734, Schiodt, Holzle, and Chinchen (collectively referred to as the primary references) disclose the water gas-shift reaction, wherein the catalyst comprises copper and oxides of manganese and zirconium. None

of the references, however, disclose or suggest the "molar ratio Mn/Zr of between 0.05 to 5.00" or that "the oxides of manganese and zirconium constitute at least 50% by weight of the catalyst in its reduced form."

The references referred to by the Examiner disclose the manganese and zirconium only as members of a list of many different oxides that may be present in a catalyst. EP 0296734 discloses a total of twelve oxides that may be present in the catalyst and does not point to any particular advantage of including either manganese or zirconium specifically and especially does not point to an advantage of combining these two specific oxides out of the twelve listed. (pg 3, lines 2-5). Schiodt recites a total of eight oxides that may be present in the catalyst. (Abstract, claim 1). Holzle discloses five possible oxides which *may* replace some of the alumina which *may* be in the catalyst. (col. 5, lines 20-24). Finally, Chinchen discloses that the catalyst also contains one or more of a list of seven oxides. (col. 3, lines 30-52).

The primary references cited in the Office Action do not disclose a catalyst wherein *both* of these oxides are present in the *same* catalyst. While it is well known in the art that manganese oxide and zirconium oxide separately have some activity for catalyzing the water gas shift reaction, it is highly surprising that there is a strong synergistic effect between these two oxides. (Specification, page 3, lines 21-24). In fact, a microscopic mixture of manganese oxide and zirconium oxide has a much higher catalytic activity than any of the pure oxides. (Specification, page 3, lines 25-27). The synergistic effect of manganese oxide and zirconium oxide is particularly surprising in view of the fact that similarly prepared magnesium/zirconium and manganese/titanium oxides have a very low activity. (Specification, page 4, lines 4-7). To further support this contention, reference may be made to the attached graph which shows the higher activity of both the fresh and spent manganese/zirconium oxide catalyst as compared to

the magnesium/zirconium oxide catalyst. Additionally, the mixed manganese-zirconium oxide catalysts have the advantage of being extremely selective. (Specification, page 4, lines 16-17). The disclosure of manganese and zirconium as members of a list of possible oxides to be included in catalysts does not suggest that they should be combined in this particular combination to achieve the surprising results that are achieved when they are combined into a *single* catalyst. The fact that none of the examples in the primary references uses a catalyst combining manganese and zirconium strengthens this contention.

Additionally, the primary references do not specifically disclose or suggest combining manganese and zirconium oxides in a molar ratio Mn/Zr of between 0.05 and 5.00. In the field of catalysts, the ratio of the metals in the catalyst is an essential part of the invention. The ratio of the metals in a catalyst is what defines the success of the catalyst. Therefore, the combination of manganese and zirconium oxides in a molar ratio Mn/Zr of between 0.05 and 5.00 is essential to the invention.

The primary references cited in the Office Action also do not disclose that the oxides of manganese and zirconium constitute at least 50% by weight of the catalyst in its reduced form. Again, it is the particular combination of the available materials that makes a catalyst successful. Therefore, the requirement that the oxides of manganese and zirconium constitute at least 50% by weight of the catalyst in its reduced form is essential to the invention as well.

Additionally, since the primary references do not disclose or suggest a known or conventional water gas-shift catalyst, using Baumann as a basis for the suggestion that "any known or conventional water gas-shift catalyst could be employed to convert CO to hydrogen present in synthesis gas" would not be applicable to the present application.

In view of the above amendment, applicant submits that the pending application is in condition for allowance.

Dated: December 6, 2005

Respectfully submitted,

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